

IN THE CLAIMS:

1. (Currently Amended) A light source apparatus for providing illuminating light to an endoscope, comprising:

a light source lamp for generating illuminating light;

a digital micromirror device having a plurality of micromirrors which receive and reflect the illuminating light generated by the light source lamp, wherein each of the plurality of micromirrors rotates to change a reflection direction of said illuminating light;

a light-converging optical system for directing the illuminating light reflected by the plurality of micromirrors to be incident on a light guide integrated in the endoscope;
and

a mirror control circuit which determines whether or not the illuminating light should impinge on the light guide integrated in the endoscope by altering the direction of the illuminating light reflected by the plurality of micromirrors of the digital micromirror device based on an exposure-time control signal introduced in accordance with the type of an imaging element installed in the endoscope[.];

a mirror which reflects an incident light component out of light reflected by the digital micromirror device towards the light guide introduced in the endoscope; and

a light integrating device for uniformly integrating the reflected light inserted between the mirror and the light-converging optical system.

2. (Previously Presented) A light source apparatus of claim 1 wherein:

the mirror control circuit controls the supply of illuminating light to the light guide by altering the direction of the illuminating light reflected by the plurality of micromirrors, based on the exposure-time control signal introduced in accordance with a time

required for charge reading corresponding with the number of pixels of the imaging element installed in the endoscope.

3. (Previously Presented) A light source apparatus of claim 2 wherein:
the mirror control circuit controls the plurality of micromirrors of the digital micromirror device based on a read-out timing of the imaging element provided by a timing generator which provides a processing timing in synchronization with the charge reading time corresponding to the number of pixels of the imaging element.

4. (Canceled)

5. (Previously Presented) A light source apparatus of claim 1, wherein the digital micromirror device comprises:

driving means which determines the incidence or non-incidence of the illuminating light on the light guide introduced in the endoscope by driving the plurality of micromirrors.

6. (Canceled)

7. (Cancelled)

8. (Previously Presented) A light source apparatus of claim 4 wherein:
an optical filter is introduced such that it periodically intercepts a light path between the mirror and the light-converging optical system to allow, out of the illuminating light, light components with a limited range of wavelengths to pass through.

9. (Original) A light source apparatus of claim 8 wherein:

the optical filter is a rotational filter obtained by arranging a plurality of sectors around the center, each defining a region which can filter light components with a specified range of wavelengths.

10. (Previously Presented) A light source apparatus of claim 8 wherein:

the mirror control circuit controls the supply of illuminating light to the light guide by altering the direction of illuminating light reflected by the digital micromirror device based on the exposure-time control signal introduced in accordance with a time required for charge reading corresponding to the number of pixels of the imaging element installed in the endoscope, the control comprising reducing a time for light shielding when the number of pixels of the imaging element is so small that charge reading will be completed in a short time, and extending the time for light shielding when the number of pixels of the imaging element is so large that charge reading will take a long time.

11. (Currently Amended) An endoscope system for enabling endoscopic observation by providing illuminating light to an endoscope, comprising:

a light source lamp for generating illuminating light;

digital micromirror device having a plurality of micromirrors which receive and reflect the illuminating light generated by the light source lamp, wherein each of the plurality of micromirrors rotates to change a reflection direction of said illuminating light;

a light guide which is capable of transmitting the illuminating light and which is installed in the endoscope;

a light-converging optical system for directing the illuminating light reflected by the plurality of micromirrors of the digital micromirror device to be incident on the light guide;

an imaging element installed in the endoscope;

a type determining circuit for determining the type of the imaging element;

a control signal generating circuit which generates an exposure-time control signal responsible for controlling the exposure time of the imaging element in accordance with the type of the imaging element determined by the type determining circuit; and

a mirror control circuit which determines whether or not the illuminating light should impinge on the light guide introduced in the endoscope by altering the direction of the illuminating light reflected by the plurality of micromirrors of the digital micromirror device based on the exposure-time control signal generated by the control signal generating circuit[.];

a mirror which reflects an incident light component out of light reflected by the digital micromirror device towards the light guide introduced in the endoscope; and

a light integrating device for uniformly integrating the reflected light inserted between the mirror and the light-converging optical system.

12. (Previously Presented) An endoscope system of claim 11 wherein:
the imaging element is installed within a tip of an insertion segment of the endoscope.

13. (Original) An endoscope system of claim 11 wherein:

the type determining circuit for determining the type of imaging element determines the type of imaging element installed in the endoscope and detects the time required by the imaging element for charge reading.

14. (Previously Presented) An endoscope system of claim 13 wherein:
the mirror control circuit determines whether or not the illuminating light should impinge on the light guide by altering the direction of the illuminating light reflected by the plurality of micromirrors of the digital micromirror device based on the exposure-time control signal introduced in accordance with a charge reading time corresponding to the number of pixels of the imaging element detected by the type determining circuit.

15. (Previously Presented) An endoscope system of claim 13 wherein:
the mirror control circuit controls the plurality of micromirrors of the digital micromirror device based on an imaging element read-out timing provided by a timing generator which provides a processing timing in synchronization with the charge reading time corresponding to the number of pixels of the imaging element.

16. (Canceled)

17. (Cancelled)

18. (Previously Presented) An endoscope system of claim 16 wherein:
an optical filter is introduced such that the optical filter periodically intercepts a light path between the mirror and the light-converging optical system to control the passage of illuminating light, thereby allowing light components with a specified wavelength to pass through.

19. (Previously Presented) An endoscope system of claim 18 wherein:

the mirror control circuit controls the supply of illuminating light to the light guide by altering the direction of the illuminating light reflected by the digital micromirror device based on the exposure-time control signal introduced in accordance with a time required for charge reading corresponding to the number of pixels of the imaging element installed in the endoscope, the control comprising reducing a time for light shielding when the number of pixels of the imaging element is so small that charge reading will be completed in a short time, and extending the time for light shielding when the number of pixels of the imaging element is so large that charge reading will take a long time.